Sect 1.1: # 1, 9, 10

i. Generalize #9 and prove by induction that

\[ |x_1 + x_2 + \ldots + x_n| \leq |x_1| + |x_2| + \ldots + |x_n| \]

for \( n = 3, 4, 5, 6, \ldots \). You may assume that the triangle inequality (\( n=2 \)) has been proven true.

Sect 1.4 #1, 8, 10ab

Tolerances and Waiting Times:
For each of the following sequences, use Excel to calculate the elements in the sequence and then:

a. Determine what the limit of the sequence is.
b. For each of the tolerances .1, .05 and .01, find the corresponding waiting time \( N \).

i. \( a_n = 3 + \frac{1}{2^n} \)

ii. \( a_n = \sqrt{n} \)

iii. \( a_n = 1 + (-1)^n \frac{1}{\sqrt{n}} \).